REMARKS

Claims 1 to 25 are pending in the application, of which claims 1 and 16 are independent. Favorable reconsideration and further examination are respectfully requested.

Objection to the drawings

The examiner objected to the drawings originally submitted with the application. In response to the objection, the applicants submit herewith one sheet of corrected drawings. In Fig. 1, the elements have been labeled as suggested by the examiner. Further, the direction of the arrows for connections 34 and 38 has been changed so that Fig. 1 is consistent with the text on page 7, lines 18-20 and lines 27-28. No new matter has been added. The applicants respectfully request withdrawal of the objection to the drawings.

35 U.S.C. § 112, second paragraph rejection

The examiner rejected claims 15 and 25 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In this regard, the examiner stated on page 2 of the Office action that:

> The meaning of "optical radiation" in claims 15 and 25 is unclear. Is it the same as "electromagnetic radiation? Please clarify.

Optical radiation is electromagnetic radiation of frequency (or wavelength) that can be focused, dispersed, and detected using optical components such as lenses, mirrors, and gratings. (See Exhibit A: <http://telsat.belspo.be/glossary/glos_o.html>).

The applicants have amended claims 22 and 24 to provide antecedent basis for "the controller" and "the adjustable mount", respectively.

35 U.S.C. § 102(a) rejection

Sugioka

The examiner rejected claims 1-6, 11, 12, 14, 15 and 16 under 35 U.S.C. § 102(a) as being anticipated by Sugioka (U.S. 6,180,915).

Independent claim 1 is directed to a method of laser marking. The method includes (1) directing irradiation having an energy fluence above the ablation threshold of the target material onto the target material such that at least some of the target material is ablated and thrown onto a surface of the markable material; and (2) subjecting the surface of the markable material to irradiation having an energy fluence below the ablation threshold of the markable material to induce a doping interaction between the ablated material and the surface which marks the surface with the ablated material.

Sugioka is not understood to disclose or suggest the foregoing features of claim 1. Sugioka teaches a laser machining process that irradiates a laser upon a target through a material to be worked to form plasma plume. Ablation is generated on the objective surface of the material to be worked by means of interactions between the plasma and laser beam irradiated upon the material to be worked. Therefore, Sugioka does not teach ablating the target material and marking the surface of the markable material with the ablated material thrown from the target material. For at least these reasons, the applicants submit that claim 1 is allowable over Sugioka. Claims 2-6, 11, 12, 14, and 15 depend from claim 1 and are allowable for at least the same reasons.

Amended independent claim 16 is an apparatus claim that roughly corresponds to claim 1. The applicants submit that claim 16 is allowable for at least the same reasons noted above with respect to claim 1.

Paananen et al.

The examiner rejected claims 1-5, 14, 15, and 16 under 35 U.S.C. § 102(e) as being anticipated by Paananen et al. (U.S. 6,442,974; "Paananen").

Paananen is not understood to disclose or suggest the features of claim 1. Paananen teaches a method of marking a material by focusing a laser beam onto a surface of a vehicle in order to cause the vehicle to heat, melt and vaporize. Paananen then teaches transferring the detached vehicle atoms to the material to be marked without damaging the material. Paananen is silent about inducing a doping interaction between the ablated material and the surface of the markable material which marks the surface with the ablated material. For at least these reasons,

the applicants submit that claim 1 is allowable over Paananen. Claims 2-5, 14, and 15 depend from claim 1 and are allowable for at least the same reasons.

Amended independent claim 16 is an apparatus claim that roughly corresponds to claim 1. The applicants submit that claim 16 is allowable for at least the same reasons noted above with respect to claim 1.

35 U.S.C. § 103(a) rejection

Sugioka in view of Unternahrer et al.

The examiner rejected claims 7, 8, 17 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Sugioka in view of Unternahrer et al. (U.S. 5,980,101; "Unternahrer"). Sugioka has been discussed above. Unternahrer was mainly cited for the proposition that it teaches monitoring the fluence of a laser beam and controlling the fluence by using a controller to achieve a desired physical effect in an industrial application using a laser.

Even if Sugioka and Unternahrer were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 1 (from which claims 7 and 8 depend), including ablating the target material and marking the surface of the markable material with the ablated material thrown from the target material. For at least the foregoing reasons, claims 7 and 8 are allowable over the art rejection.

Similarly, even if Sugioka and Unternahrer were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 16 (from which claims 17 and 22 depend), including a irradiation source operable to generate irradiation to ablate at least part of the target material so that the ablated material is thrown onto the surface of a sample of markable material spaced apart from the sample of target material. For at least the foregoing reasons, claims 17 and 22 are allowable over the art rejection.

Paananen et al. in view of Unternahrer et al.

The examiner rejected claims 7, 8, 17 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Paananen in view of Unternahrer. Paananen has been discussed above. Unternahrer was mainly cited for the proposition that it teaches monitoring the fluence of a laser

beam and controlling the fluence by using a controller to achieve a desired physical effect in an industrial application using a laser.

Even if Paananen and Unternahrer were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 1 (from which claims 7 and 8 depend), including inducing a doping interaction between the ablated material and the surface of the markable material which marks the surface with the ablated material. For at least the foregoing reasons, claims 7 and 8 are allowable over the art rejection.

Similarly, even if Paananen and Unternahrer were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 16 (from which claims 17 and 22 depend), including inducing a doping interaction between the ablated material and the surface of the markable material which marks the surface with the ablated material. For at least the foregoing reasons, claims 17 and 22 are allowable over the art rejection.

Sugioka in view of Ito et al.

The examiner rejected claims 13, 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Sugioka in view of Ito et al. (U.S. 5,198,843; "Ito"). Sugioka has been discussed above. Ito was cited for the proposition that it teaches marking with a laser by using a relative movement between the workpiece and the laser beam by using mirrors driven by galvanometer scanners.

Even if Sugioka and Ito were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 1 (from which claim 13 depends), including ablating the target material and marking the surface of the markable material with the ablated material thrown from the target material. For at least the foregoing reasons, claim 13 is allowable over the art rejection.

Similarly, even if Sugioka and Ito were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 16 (from which claims 18 and 20 depend), including a irradiation source operable to generate irradiation to ablate at least part of the target material so that the ablated material is thrown onto the surface of a sample of

markable material spaced apart from the sample of target material. For at least the foregoing reasons, claims 18 and 20 are allowable over the art rejection.

Sugioka in view of Unternahrer et al. and further in view of Ito et al.

The examiner rejected claims 19 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Sugioka in view of Unternahrer and further in view of Ito. Claims 19 and 21 depend on claim 16 and are allowable for at least the same reasons given above with respect to claim 16.

Paananen et al. in view of Ito et al.

The examiner rejected claims 13, 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Paananen in view of Ito. Both Paananen and Ito have been discussed above.

Even if Paananen and Ito were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 1 (from which claim 13 depends), including inducing a doping interaction between the ablated material and the surface of the markable material which marks the surface with the ablated material. For at least the foregoing reasons, claim 13 is allowable over the art rejection.

Similarly, even if Paananen and Ito were combined, none of the features of the hypothetical combination discloses or suggests the features of claim 16 (from which claims 18 and 20 depend), including inducing a doping interaction between the ablated material and the surface of the markable material which marks the surface with the ablated material. For at least the foregoing reasons, claims 18 and 20 are allowable over the art rejection.

Paananen et al. in view of Unternahrer et al. and further in view of Ito et al.

The examiner rejected claims 19 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Paananen in view of Unternahrer and further in view of Ito. Claims 19 and 21 depend on claim 16 and are allowable for at least the same reasons given above with respect to claim 16.

Paananen et al. in view of Merdan et al. or Williams et al.

The examiner rejected claim 23 under 35 U.S.C. § 103(a) as being unpatentable over Paananen in view of Merdan et al. (U.S. 6,440,503; "Merdan") or Williams et al. (U.S. 4,987,006; "Williams"). Paananen has been discussed above. Both Merdan and Williams were

cited for the proposition that they individually teach an adjustable mount operable to adjust spacing between the workpiece and the target material.

Even if Paananen and Merdan or Paananen and Williams were combined, none of the features of the hypothetical combinations disclose or suggest the features of claim 16 (from which claim 23 depends), including inducing a doping interaction between the ablated material and the surface of the markable material which marks the surface with the ablated material. For at least the foregoing reasons, claim 23 is allowable over the art rejection.

Sugioka in view of Merdan et al. or Williams et al.

The examiner rejected claim 23 under 35 U.S.C. § 103(a) as being unpatentable over Sugioka in view of Merdan or Williams. Sugioka has been discussed above. Both Merdan and Williams were cited for the proposition that they individually teach an adjustable mount operable to adjust spacing between the workpiece and the target material.

Even if Sugioka and Merdan or Sugioka and Williams were combined, none of the features of the hypothetical combinations disclose or suggest the features of claim 16 (from which claim 23 depends), including a irradiation source operable to generate irradiation to ablate at least part of the target material so that the ablated material is thrown onto the surface of a sample of markable material spaced apart from the sample of target material. For at least the foregoing reasons, claim 23 is allowable over the art rejection.

The remaining references made of record and not relied upon

The applicants have reviewed Roche (France 2,666,759), Foley (U.S. 5,156,938), Burns (U.S. 4,213,704), and Newman (U.S. 4,814,259) that were made of record and not relied upon. The applicants do not believe that any of the references teach or suggest a laser marking method or apparatus including the features of (1) directing irradiation having an energy fluence above the ablation threshold of the target material onto the target material such that at least some of the target material is ablated and thrown onto a surface of the markable material; and (2) subjecting the surface of the markable material to irradiation having an energy fluence below the ablation threshold of the markable material to induce a doping interaction between the ablated material

and the surface which marks the surface with the ablated material. Claims 1 to 25 are therefore believed to be allowable over these references.

Enclosed is a $475.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 12/11/03

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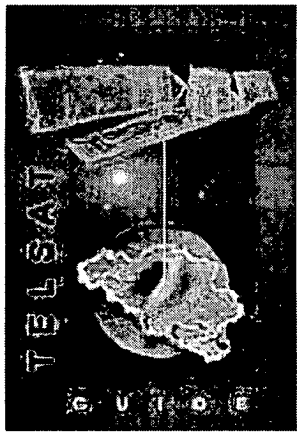
Exhibit A



Glossary of Remote Sensing Terminology
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OBJECT-DIMENSION
Determination of heights, ground areas and volumes of objects (e.g. buildings, etc.).

OBJECT-IDENTIFICATION
Mostly used for military applications - target detection and identification.

OBLIQUE
An image taken with a camera or sensor with the axis intentionally directed between the vertical and horizontal planes. A high oblique image includes the horizon in the field of view, while a low oblique shows only the Earth's surface.

OBLIQUE-SENSING
Sensing in which the optical axis of the sensor is not perpendicular to the terrain.

ONBOARD-PROCESSING
Data processing which takes place on board the sensor platform.

OPERATING-ENVIRONMENT
Environment in which a sensor operates.

OPERATIONAL-APPLICATION
Application in which well documented techniques have been, or are being used to collect data to cost-effectively meet an agency's resource management or data collection requirements.

OPTICAL-DATA-PROCESSING
Data processing making use of an optical computer, i.e. a computer that uses various combinations of holography, lasers, and mass-storage memories.

OPTICAL-DIGITAL-SYSTEM
A processing system combining both optical and digital data processing.

OPTICAL-DISK

Exhibit A

Type of disk used in a data recording system on which information is recorded by exposing the disk to the modulated radiation from a laser source.

OPTICAL-DISTORTION
A defect of an optical system in which the magnification varies with angular distance from the axis, causing straight lines to appear curved.

OPTICAL-FILTER
An optical element that selectively absorbs incident electromagnetic radiation in the visible, ultraviolet or infrared portion of the spectrum.

OPTICAL-MODULATOR
A device used for impressing information on a light beam, or a device which electrically changes the properties of a material through which light is being transmitted.

OPTICAL-POLARIZATION
Restricting the travel of electromagnetic radiation in the visible band to only one plane.

OPTICAL-PROCESSOR
An optical device capable of receiving data, manipulating it, and supplying results. A program used for such a task.

OPTICAL-PROPERTIES
The effects of a substance or medium on light or other electromagnetic radiation passing through it.

OPTICAL RADIATION
Electromagnetic radiation of frequency (or wavelength) that can be focused, dispersed, and detected using optical components such as lenses, mirrors, and gratings.

OPTICAL-SCATTEROMETER
An active sensor used for the measurement of the backscattered field of a laser illuminated surface.

OPTICAL-SCATTEROMETRY
The science and techniques involved in using optical scatterometers.

OPTICAL-SENSING
The science and techniques of using optical sensors (systems).

OPTICAL-SYSTEM
A collection of mirrors, lens, prisms, and other devices (placed in some specified configuration) which reflect, refract, disperse, absorb, polarize, or otherwise act on light. *SEE ALSO:* OPTICS.

Exhibit A

OPTICS

The study of the phenomena associated with the generation, transmission and detection of em radiation in the spectral range extending from the long wave edge of the x-ray region to the short wave edge of the radio region.

ORBIT-CROSSOVER

Points where the satellite's orbit ground track intersects.

ORIENTATION

Determination of the position of an image or photograph with respect to the attitude of the sensor.

ORTHOIMAGE

An image derived from a conventional perspective image by simple or differential rectification so that image displacements caused by sensor tilt and relief of terrain are removed.

ORTHOPHOTO

A photograph derived from a conventional perspective photograph by simple or differential rectification so that image displacements caused by camera tilt and relief of terrain are removed.

ORTHOPHOTOGRAPHY

The process of making an orthophoto.

OVERLAY-MAPPING

A mapping method in which several thematic maps of the same area can be superimposed on a base map.

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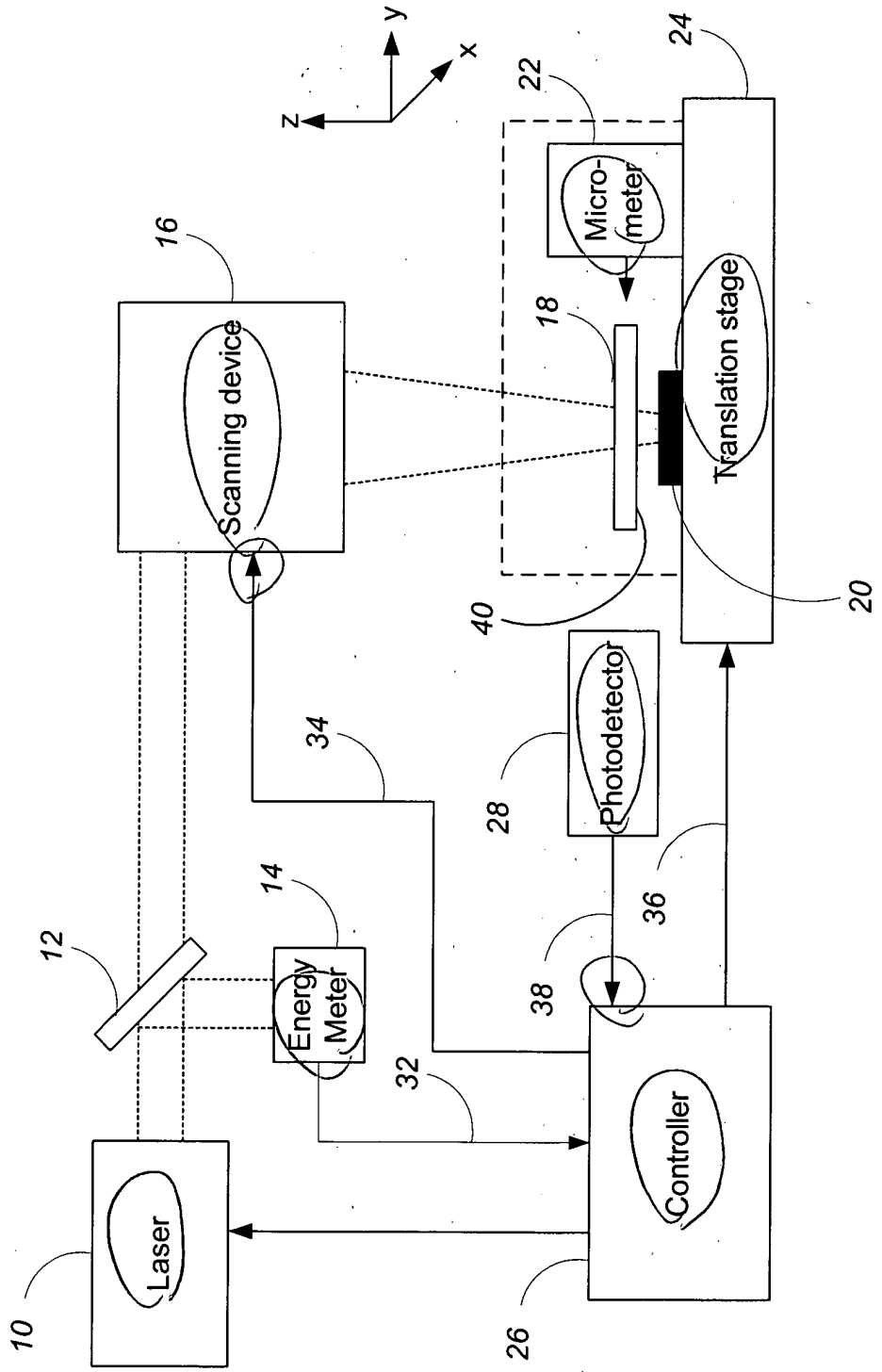

FIG. 1